# DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

# BULLETINS 1 - 20

# 1905-1907

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DEPARTMENT OF AGRICULTURE
DAIRY COMMISSIONER'S BRANCH
OTTAWA, CANADA

# CARE OF MILK

FOR

# CHEESE FACTORIES

No. 2

THIRD EDITION

PUBLISHED BY DIRECTION OF THE HON. SYDNEY A. FISHER, MINISTER OF AGRICULTURE.

MAY, 1905.

# DEPARTMENT OF AGRICULTURE
## DAIRY COMMISSIONER'S BRANCH
## OTTAWA, CANADA

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† Cargo Inspectors are stationed at Liverpool, Manchester, Bristol, London and Glasgow.

# MILK FOR CHEESE FACTORIES

By J. A. RUDDICK.

**The patrons of a cheese factory have a direct financial interest in supplying only good pure milk, free from taints or bad flavours. The greatest amount of care and skill, with which the cheesemaker may do his work, will not enable him to make a superior quality of cheese, or to secure the largest yield of it from milk which is not in good condition.**

Generally the patrons suppose that they do furnish milk in good condition, for the simple reason, that they are not able to detect anything wrong with it themselves, and are not willing always to accept the judgment of those who are specially trained in examining and handling it. One learns to judge milk, like anything else, very largely by comparison, so that the patron who handles only his own milk, is not able to decide as to its suitability for the making of finest cheese, as well as the manager of a factory who daily compares many different samples.

A great deal of stress is laid upon the importance of preventing patrons from delivering milk which has been watered, or from which cream has been taken, yet it is safe to say that for every dollar which is lost to the honest patrons through such dishonesty, there are one hundred dollars lost as a result of some patrons furnishing milk which can neither be made into the finest quality nor the largest quantity of fine cheese per 100 lb. of milk. The maker in charge is quite within his rights, and is protecting the interests of the careful patrons, when he rejects all milk which, in his judgment, is not fit to make cheese of the highest quality. Unfortunately, this practice if pushed to the full extent would, at present, curtail the supply of milk at many factories, where an unbusinesslike competition induces the makers to accept, without question, any milk, which comes to them from the area served by a neighbouring factory, at which it may have been refused because of its tainted condition. If the patrons supporting a factory only realized that any one who joins them under those conditions is very likely to cause them serious loss, it is quite certain that this sort of thing would soon be stopped.

Milk may become tainted from:—

1. Feed unsuitable for milking cows.
2. Injudicious feeding.
3. An impure water supply.
4. Want of salt by the cows.
5. Absorption of odours.
6. The germs which get into the milk during and after milking.

### FEED UNSUITABLE FOR MILKING COWS.

There is in Canada an abundance of good wholesome food available for cattle feeding purposes. The natural pastures are, on the whole, excellent, and it is only in limited districts, or at certain seasons of the year, that trouble is experienced with weed flavours. Among the cultivated foods, turnips and rape are two prominent exceptions to the rule of suitability which applies in general to Canadian fodder crops.

While they are undoubtedly valuable in a ration for growing or dry cattle, if turnips and rape are fed, even in limited quantities, to milking cows, there is a likelihood of imparting to the milk a taint which cannot be eliminated by any process known to the cheesemaker's art.

### INJUDICIOUS FEEDING.

Some first-class feeds if fed alone, and to excess, will cause indigestion and thus indirectly affect the milk. One example of this kind is found in green clover.

### AN IMPURE WATER SUPPLY.

An abundant supply of pure water is one of the essentials for the production of good milk. When cows are compelled to drink the water of swamps, muddy ponds, or sluggish streams and ditches, in which there is decaying animal matter, including their own droppings, there is a constant menace to their health, and unless cows are in good health they cannot give first-class milk. Moreover, the mud, often full of foul germs, which collects on the legs, flanks and udders of the cows, and falls into the milk at the time of milking, is a direct source of infection, which is often overlooked.

### WANT OF SALT BY THE COWS.

When cows have free access to salt at all times they will give more milk, which will have a better flavour and keep sweet longer than when they do not get any at all or receive it only at intervals.

### ABSORPTION OF ODOURS.

It is a well-known fact that milk will absorb some odours to which it is exposed. Warm milk will absorb odours quite as readily as that which has been cooled; hence the necessity for removing it from the stable or milking yard as soon as possible after it is drawn.

The foregoing causes of tainted or gassy milk have been mentioned as indicating some of the possible sources of such defects, but the most common cause of all is

### THE UNDESIRABLE GERMS WHICH GET INTO THE MILK DURING AND AFTER MILKING.

These germs are always associated with filth in some form or other. Careful investigations show that a very large proportion of the cases of taints or bad flavours in milk and its products, are caused by the germs which are always present in the droppings of animals. Such germs are to be found in large numbers wherever such droppings are deposited. The mud of stagnant ponds where cattle are allowed to drink, and the surfaces of barn-yards or milking yards are always swarming with them. Hence the reason why the udders and flanks of cows should be always brushed before milking to remove the dried mud, particles of manure, hairs, &c., which might otherwise fall into the milk pail. Straining the milk, while it is necessary to remove the visible dirt, does not get rid of those foul germs, which are the actual cause of the tainted, gassy milk.

Improperly cleaned milk pails, strainers or milk cans are a constant source of contamination.

The whey tank is a common source of infection at those factories where the whey is returned to the patrons in the milk cans. This practice is detrimental to successful cheesemaking, but when it cannot be arranged to have the whey disposed of in some

other way, the tanks should be kept thoroughly cleaned in order to lessen the danger of contamination. They should be emptied at least once a week.

The practice of putting cloth under the covers of the milk cans, which is common in some localities, should be discontinued, because it is a frequent source of tainted milk.

In dairy work it is not possible to completely exclude from the milk all the injurious bacteria, therefore, the means which may be employed to prevent the growth and development of such as have found access becomes highly important.

## AERATION AND COOLING.

Aeration and cooling are the two effective methods within reach of the patrons for preserving milk in good condition for cheese-making purposes.

Aeration, or, in other words, the exposure of the milk to pure air in a thin film, or spray, or by forcing air through it, or by dipping or pouring, has the effect of reducing the temperature to some extent. It must not be forgotten, however, that unless aeration is carried on in a place where the atmosphere is free from dust or foul odours, and away from barn-yards, stables or other places where cows are milked, it may be the means of contaminating the milk rather than improving it.

Milk is not prevented from turning sour by aeration, except so far as the process lowers the temperature. In cool weather the reduction of temperature may be considerable, but on the other hand when the air is very warm, the effect is very slight. It is necessary, therefore, during the hottest weather, to supplement the aeration with cooling by cold water.

Utensils constructed to combine the effect of aeration and cooling are useful for this purpose, or the vessels containing the milk may be surrounded with cold water. Cooling will be more easily accomplished if the milk is held in small vessels rather than in large ones.

## HONEST MILK.

All milk supplied to cheese factories should be valued and paid for on the basis of the quantity of fat contained in it. Some factories have adopted the plan of adding the figure 2 to the percentage of fat before the calculations are made. The adulteration of milk by the addition of water, the removal of any portion of the cream, and the keeping back of any part of the strippings are forbidden by the Dominion Statutes.

## SUMMARY OF IMPORTANT POINTS.

### *For the Factory Owners.*

1. Provide a supply of good, pure water for the purposes of the factory.
2. Provide efficient drainage to prevent the slops and waste water from becoming a nuisance and possibly contaminating the products of the factory.
3. Where whey is returned to the patrons arrange the whey tank so that it may be easily cleaned, and then insist on it being kept clean.
4. Support your cheesemaker in dealing firmly with patrons who bring milk which is not in good condition; or else do not expect him to bear any losses which may occur through bad flavoured cheese.

### *For the Cheesemaker.*

1. Attend personally to the taking in of the milk as far as possible.
2. Keep your weighing stand and everything thereon, including your own person, thoroughly clean. You have no right to require the patrons to furnish clean milk unless you set a good example.

3. Make fermentation tests of each patron's milk as frequently as possible. By this means you will often locate taints which are not discernible when the milk is being received.

*For the Patrons.*

1. Only milk from cows in good health should be sent to the factory.

2. Milk from a freshly calved cow should not be sent till after the eighth milking.

3. Pure water should be provided for the cows in unlimited quantities, and cows should be prohibited from drinking stagnant, impure water.

4. A box or trough, containing salt to which the cows have free access, should always be provided.

5. Cows should never be driven fast, and it pays to treat them with invariable kindness.

6. It pays to make cows comfortable under all conditions.

7. All the vessels used in the handling of milk should be thoroughly cleaned immediately after their use. A washing in tepid water to which a little soda has been added, and a subsequent scalding with boiling water, will prepare them for *airing,* that they may remain perfectly sweet. A brush is preferable to a dish-cloth for use in cleaning. They should be protected from dust which always carries large numbers of the bad forms of bacteria.

8. Cows should be milked with *dry* hands, and only after the udders have been washed or brushed clean.

9. Tin pails only should be used.

10. All milk should be strained *immediately* after it is drawn.

11. Milking should be done, and milk should be kept only in a place where the surrounding air is pure. Otherwise the presence of the tainting germs and odours will injure the milk.

12. All milk should be *aired* immediately after it has been strained. That treatment is equally beneficial to the evening and morning messes of milk.

13. *In warm weather all milk should be cooled* to a temperature of 70 degrees Fahr. or lower.

14. Milk-stands should be constructed to shade the cans or vessels containing milk, as well as to protect them from rain. Swine should not be fed near the milk stand.

**Copies of this Bulletin may be obtained free, in English and in French, for each patron of a factory, by application to the Dairy Commissioner Department of Agriculture, Ottawa.**

DEPARTMENT OF AGRICULTURE
COMMISSIONER'S BRANCH - - - DAIRY DIVISION
OTTAWA, CANADA

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# MILK

FOR

# CREAMERIES

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